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Research Says / Evidence on Flipped Classrooms Is Still Coming In

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The classroom lecture—it's been criticized, despised, even lampooned. An entire generation of moviegoers can recite Ben Stein's plea for students to wake up and respond to his dead-pan, droning lecture in *Ferris Bueller's Day Off*. ("Anyone? ... Anyone?")

Lectures aren't necessarily bad—they can be an effective way to help students acquire new knowledge (Hattie, 2008; Schwerdt & Wupperman, 2010). The problem with lectures is often a matter of pacing. For some students, the information may come too slowly or cover what they already know; other students may have trouble taking in information so rapidly, or they may lack the prior knowledge they need to understand the concepts presented. After a hit-or-miss lecture, teachers often assign homework, which many students perform in a private hell of frustration and confusion. What did my teacher say about cross-multiplying? Comma use in compound sentences? The Laffer curve?

Some teachers are now turning this model on its head, creating *flipped* or *inverted* classrooms in which they record lectures and post them online. Students watch the lectures at home, where they can speed through content they already understand or stop and review content they missed the first time the teacher discussed it (and might have been too embarrassed to ask their teacher to repeat in class). Online lectures can also easily incorporate visual representations, such as interactive graphs, videos, or photos of important historical events.

A Growing Practice, but Little Research

The flipped classroom seems to be catching on. According to the Flipped Learning Network (2012), membership on its social media site rose from 2,500 teachers in 2011 to 9,000 teachers in 2012. But does research show that this innovation, sensible as it sounds, really improves learning?

To date, there's no scientific research base to indicate exactly how well flipped classrooms work. But some preliminary nonscientific data suggest that flipping the classroom may produce benefits. In one survey of 453 teachers who flipped their classrooms, 67 percent reported increased test scores, with particular benefits for students in advanced placement classes and students with special needs; 80 percent reported improved student attitudes; and 99 percent said they would flip their classrooms again next year (Flipped Learning Network, 2012). Clintondale High School in Michigan saw the failure rate of its 9th grade math students drop from 44 to 13 percent after adopting flipped classrooms (Finkel, 2012).

The Indirect Research Base

The lack of hard scientific evidence doesn't mean teachers should *not* flip their classrooms; indeed, if we only implemented strategies supported by decades of research, we'd never try anything new. Until researchers are able to provide reliable data, perhaps the best we can do is to ask, Do the purported benefits of flipped classrooms reflect research-based principles of effective teaching and learning?

Improved Student–Teacher Interaction

Advocates of the flipped classroom claim that this practice promotes better student–teacher interaction. For example, Bergmann and Sams (2012) point out that when teachers aren't standing in front of the classroom talking *at* students, they can circulate and talk *with* students. If teachers use inverted classrooms this way, they are likely to better understand and respond to students' emotional and learning needs.

Research makes a strong case for the benefits of such interaction. Studies have shown that having teachers who recognize and respond to students' social and emotional needs is at least as important to academic development as specific instructional practices are, and this is especially true for at-risk students (Hamre & Pianta, 2005).

Opportunities for Real-Time Feedback

Proponents of flipped classrooms also assert that increased student–teacher interactions give teachers more opportunities to provide feedback to students. For example, a small pilot study funded by the Gates Foundation observed that during a five-week summer school program in which students received instruction through the Khan Academy website along with support from a teacher, the teacher spent significantly more one-on-one time with students than she had in her traditional classroom; thus, she was able to provide more feedback and immediately correct student misperceptions (Greenberg, Medlock, & Stephens, 2011).

Such increased opportunities for feedback could improve student learning because feedback has one of the strongest effect sizes of any instructional practice—in the 0.73–0.76 range, according to two meta-analyses (Beesley & Apthorp, 2010; Hattie, 2008).

Student Engagement

Another purported benefit of flipped classrooms is that "they speak the language of today's students" (Bergmann & Sams, 2012, p. 20), who are accustomed to turning to the web and social media for information and interaction. There may also be another, deeper, reason students find video lectures more engaging: Brain research tells us that the novelty of any stimulus tends to wear off after about 10 minutes, and as a result, learners tend to check out after 10 minutes of exposure to new content. After that, they either need a change of stimulus, emotional variety, or an opportunity to step back and process what they're learning (Medina, 2008). One benefit, then, of placing lectures online may be that they can break down direct instruction into more engaging, 10-minute bites of learning.

Self-Paced Learning

As noted earlier, putting lectures online enables students to pace their own learning according to their needs. Potentially, an inverted classroom allows the teacher to place an entire year or semester's worth of lectures online, enabling students to accelerate through the curriculum if they are ready. According to John Hattie's (2008) synthesis of 800 research meta-analyses, such acceleration has one of the strongest effect sizes (0.88) of any instructional intervention.

More Meaningful Homework

Another purported benefit of flipped classrooms is that they alter the nature of homework by having students practice and apply their learning in the classroom, under the watchful eye of the teacher (Bergmann & Sams, 2012; Greenberg, Medlock, & Stephens, 2011). In current practice, homework often appears ineffective in promoting learning. Beesley and Apthorp (2010) found that targeted, in-class opportunities for students to practice their skills with corrective teacher feedback had an effect size nearly four times that of homework, in which teachers had few opportunities to monitor students during their practice.

Flipping the Paradigm

At this time, we do not have direct scientific research to establish whether flipped classrooms increase student learning. But absence of evidence is not evidence of absence. Indeed, there's reason to believe that flipped classrooms may enhance student learning if they are implemented thoughtfully, with careful attention to what research tells us about good instruction.

What inverted classrooms may really be flipping is not just the classroom, but the entire paradigm of teaching—away

from a traditional model of teachers as imparters of knowledge and toward a model of teachers as coaches who carefully observe students, identify their learning needs, and guide them to higher levels of learning.

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